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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,358	09/26/2006	Siebe Tjerk De Zwart	NL 040333	7296
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EXAMINER BYRNIE-DIAKUN, JORI S				
ART UNIT 4176		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/599,358

Applicant(s)

DE ZWART ET AL.

Examiner

Jori S. Byrne-Diakun

Art Unit

4176

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the Applicants' communication filed on 26 September 2006 as a 371 continuation of PCT/IB05/50970. In virtue of this communication, Claims 1-13 are currently pending in the instant application.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Disclosure Objections

Drawings

2. The drawings are objected to because 2a2 is not the proper denotation for the angle size in between elements 27 and 33 in Fig. 3 in accordance with the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are further objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 41 (see Figs. 5-6), β (see Figs. 5-6), and γ (see Fig. 5-6). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to under 37 CFR 1.84(h)(5) because Fig. 4 shows modified forms of construction in the same view (see [0011] of the specification, wherein Applicant discloses that 37 and the combination of 38 and 39 are alternative embodiments; Fig. 4 represents 37-39 as a single system instead of as two separate modified constructions). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should

include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities: the format of the specification does not conform to the guidelines set forth in MPEP 608.01. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitations “the first and the second axis” in Line 3. There is insufficient antecedent basis for this limitation in the claim.

For purposes of examination, “the first and the second axis” are understood to be the X and Y axes.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 4-5, 9-11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishikawa (U.S. Patent No. 4,796,965 A).

With respect to Claim 1, Ishikawa discloses, in Fig. 10, a projection system for displaying image information comprising an illumination system for generating a light beam (18A, termed a “laser light source”), a scanning device comprising a mirror (16, termed a “reflecting surface”, of 10, termed a “multifaceted rotating mirror”) for scanning the light beam to form an image on a screen, and a scan angle enlarger cooperating with the scanning device for enlarging a scan angle

of the polarized light beam (24, termed a “plane mirror”, and 26B, termed a “plane correction mirror”), characterized in that the scan angle enlarger comprises a reflective polarizer (26a, termed a “polarized light beam-splitter”), a quarter-wave plate (26b, termed a “ $\frac{\lambda}{4}$ plate”), and a mirror (24, termed a “plane mirror”) arranged to reflect the light beam at least once between the reflective polarizer and the mirror via the quarter-wave plate (see Fig. 10).

With respect to Claim 4, Ishikawa further discloses, in Fig. 10, that the orientation of the fast axis of the quarter-wave plate is directed at an angle of 45 degrees to the axis of polarization of the reflective polarizer (see Fig. 10).

With respect to Claim 5, Ishikawa further discloses, in Fig. 10, that the orientation of the reflective polarizer and the orientation of the quarter-wave plate are directed in a first plane parallel to the first and the second axis, the second axis being perpendicular to the first axis, and wherein the orientation of the mirror is directed in a second plane parallel to the first axis and at a predetermined angle of inclination θ to the second axis for directing higher-order reflections of the light beam in different directions from the mirror (see Fig. 10).

With respect to Claim 9, Ishikawa further discloses, in Fig. 10, that the mirror (24), the quarter-wave plate (26b), and the reflective polarizer (26a) are flat, unstructured, optical elements (see Fig. 10).

With respect to Claim 10, Ishikawa further discloses, in Fig. 10, that the quarter-wave plate and the reflective polarizer are integrated in a single optical element (10B, termed “plane correction mirror”).

With respect to Claim 11, Ishikawa further discloses, in Fig. 10, that the illumination system comprises a semiconductor laser (18A) for generating a linearly polarized light beam (see Col. 4, Lines 5-7).

With respect to Claim 13, Ishikawa further implicitly discloses that the projection system comprises a modulating device for modulating the polarized light beam (laser beam optical systems used for printing systems and scanning systems such as taught by Cannon et al. conventionally have laser light intensity controls, such as APC schemes; See Prior Art of Record Inoue et al., Col. 1, Lines 12-26 for further clarification).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (U.S. Patent No. 4,796,965 A) in view of Faris (U.S. Patent No. 5,327,285 A).

With respect to Claim 2, Ishikawa discloses all limitations of Claim 1.

Ishikawa does not teach that the reflective polarizer comprises a first portion and a second portion, wherein the axis of polarization of the first portion is perpendicular to the axis of polarization of the second portion.

Faris discloses, in Fig. 4, constructing a polarizer (16, termed the “final product”) comprising of a first portion (13) and a second portion (14), wherein the axis of polarization of the first portion is perpendicular to the axis of polarization of the second portion (see Col. 3, Lines 63-66).

It would have been obvious to one of ordinary skill in the art at the time of invention to construct the polarizer of Ishikawa using the methodology taught by Faris, resulting in a polarizer comprising two sections with orthogonal axes of polarization, to predictably screen the light flowing through the polarizer for light not properly polarized upon first circuit through the optical system.

With respect to Claim 3, the combination of Ishikawa and Faris disclose, in Fig. 4 of Faris, configuring a polarizer with portions which are aligned such that the axes of polarization are orthogonal. The combination of Ishikawa and Faris does not explicitly disclose that the polarizer comprises one or more third portions positioned between the first and the second portion, wherein the axis of polarization of the one or more portions is perpendicular to a direction of polarization of one or more respective reflected light beams received by the respective one or more third portions from the mirror. However, in view of the methodology

taught by Faris, and because it has been held that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced, it would have been obvious to one of ordinary skill in the art at the time of invention to apply further one or more third portions to the polarizer using the method taught by Faris to further predictably screen the light flowing through the polarizer for light not properly polarized upon first circuit through the optical system.

13. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (U.S. Patent No. 4,796,965 A) in view of Pfibsen et al. (U.S. Patent No. 4,991,953 A).

With respect to Claim 6, Ishikawa discloses all limitations of Claim 1.

Ishikawa does not teach that the projection system is provided with an angular beam separator positioned between the reflective polarizer and the screen for transmitting a predetermined order of reflection of the light beam.

Pfibsen et al. discloses, in Fig. 1, a laser optical scanning system with a beam expander (2) followed by an angular beam separator (comprising the combination of 3, termed a "cylindrical lens", and 4, termed a "slit diaphragm") for transmitting a predetermined order of reflection of the light beam.

It would have been obvious to one of ordinary skill in the art at the time of invention to enhance the optical projection system of Ishikawa with the angular beam separator taught by Pfibsen et al., resulting in an optical system with a scan angle enlarger followed by an angular beam separator such that the angular beam separator is arranged between the reflecting polarizer and a projection objective, to predictably screen out portions of the reflected light which are

deemed undesirable for the optimal functioning of the system as a whole and to predictably limit distortion in the system.

With respect to Claim 7, the combination of Ishikawa and Pfibsen et al. further disclose, in Fig 1 of Pfibsen et al., that the angular beam separator is provided with a rectangular aperture having its long axis directed parallel to the first axis (see the rectangular slit in 4, termed a “slit diaphragm”, in Fig.1).

With respect to Claim 8, the combination of Ishikawa and Pfibsen et al. further disclose, in Fig 1 of Pfibsen et al., that the angular beam separator comprises a cylindrical lens (3) and a diaphragm (4, termed a “slit diaphragm”).

14. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (U.S. Patent No. 4,796,965 A).

With respect to Claim 12, Ishikawa further discloses, in Fig. 10, that the mirror is formed by a reflecting surface (16) of a rotatable polygon (10, termed a “multifaceted rotating mirror” of polygonal shape, see Fig. 1). Ishikawa does not specifically teach that the rotatable polygon is a hexagon. However, it has been held that configuration, with regards to shape, is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration is significant. Therefore, it would have been obvious

to one of ordinary skill in the art at the time of invention to form the rotatable polygon of Ishikawa as a hexagon.

Citation of Relevant Prior Art

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Prior Art Yoshikawa et al. (U.S. Patent No. 5,751,464 A) teaches an optical scanner and image forming apparatus with a hexagonal rotatable mirror, laser light source, and optical systems.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jori S. Byrne-Diakun whose telephone number is (571) 270-7555. The examiner can normally be reached on 7:30 AM to 5 PM EST, Monday thru Friday with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thuy V. Tran can be reached on (571) 272-1828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S. B./
Examiner, Art Unit 4176
03/17/2009

/Thuy Vinh Tran/
Supervisory Patent Examiner, Art Unit 4176
03/24/09